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Lisa K. Jorgenson, Esq.
STMicroelectronics, Inc.
1310 Electronics Drive
Carrollton, TX 75006

EXAMINER
ZHU, BO HUI ALVIN

ART UNIT	PAPER NUMBER
2619	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>15 October 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-20</u> is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-20</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   The amendment filed on October 15, 2007 has been entered.

Claims 1 – 20 are pending.

Claims 1 – 20 are rejected.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3.   Claims 1 – 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The subject matter "a block based memory allocation unit" was not described in the specification.

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5.   Claims 3 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

It is not clear what it meant by "a selected limited number of memory blocks".

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7.   Claims 1 – 3, 5 – 16 and 18 – 20 are rejected under 35 U.S.C. 102(e) as being

anticipated by Hariguchi et al. (US 6,665,297).

(1) with regard to claims 1 and 14:

Hariguchi et al. discloses a system and method, comprising: at least one hash

table (70 on Fig. 2A) storing prefixes for address lookups; and a content addressable

memory (80 on Fig. 2A) storing at least some prefixes for which a collision occurs within

the at least one hash table (column 6, lines 31 – 39); and a block based hashing search

mechanism that comprises a routing table (40 on Fig. 2A) implemented with selective

hashing for a plurality of prefixes with different lengths (column 5, lines 20 – 24); and a

block based memory allocation unit that allocates memory blocks to said at least one

hash table (column 6, line 66 – column 7, line 2; column 8, line 56 - column 9, lines 7;

the hash bucket can be viewed as a unit for allocating memory for storing the route

entries).

(2) with regard to claims 2 and 15:

Hariguchi et al. further discloses that the at least one hash table is contained

within a smallest number of memory blocks sufficient to hold all required prefixes for

which no collision occurs within the at least one hash table (column 6, lines 31 – 39;

column 9, lines 12 – 15).

(3) with regard to claims 3 and 16:

Hariguchi et al. further discloses that the at least one hash table is contained

within a selected limited number of memory blocks (the size of the memory of the

routing table 40 is selected and limited because each hash circuit associates with a

different length of prefix and contains limited memory for storing route entries).

(4) with regard to claims 5 and 18:

Hariguchi et al. further discloses that the at least one hash table comprises a

plurality of hash tables, each hash table containing different length prefixes (column 5,

lines 20 – 31).

(5) with regard to claims 6 and 19:

Hariguchi et al. further discloses a priority encoder (172 on Fig. 5) selecting a

longest prefix when a plurality of matches occur between different length portions of a

prefix and prefixes in each of two or more of the plurality of hash tables (column 8, lines
4 – 8).

(6) with regard to claims 7 and 20:

Hariguchi et al. further discloses that the plurality of hash tables contain only a
subset of different length prefixes possible under an addressing scheme, and wherein a
remainder of the different length prefixes are stored in the content addressable memory
(column 6, lines 30 – 39).

(7) with regard to claim 8:

Hariguchi et al. discloses a network router (26 on Fig. 2A) including the address
lookup structure according to claim 1, the network router further comprising: a network
search engine (70 on Fig. 2A) containing the at least one hash table and coupled to the
content addressable memory, the network search engine performing address lookups
using the at least one hash table; and an external memory (98 on Fig. 2A) coupled to
the network search engine and containing per route information indexed by a next hop
index generated by the network search engine.

(8) with regard to claim 9:

Hariguchi et al. discloses a network (20 on Fig. 1) including a plurality of
interconnected network routers (26, 28, 30 – 38 on Fig. 1) according to claim 8.

(9) with regard to claim 10:

Hariguchi et al. discloses that a plurality of hash tables, each hash table
containing different length prefixes (column 5, lines 20 – 31); each hash table containing
different length than prefixes within other hash tables with in the plurality (column 5,

lines 20 – 31); and the plurality of hash tables collectively containing only a subset of

different prefix lengths less than or equal to an address lengths and a remainder of the

different address lengths are handled by an additional address lookup facility (column 6,

lines 30 – 39); and a block based hashing search mechanism that comprises a routing

table (40 on Fig. 2A) implemented with selective hashing for a plurality of prefixes with

different lengths (column 5, lines 20 – 24); and a block based memory allocation unit

that allocates memory blocks to said at least one hash table (column 6, line 66 – column

7, line 2; column 8, line 56 - column 9, lines 7; the hash bucket can be viewed as a unit

for allocating memory for storing the route entries).

(10) with regard to claim 11:

Hariguchi et al. further discloses the additional address lookup facility comprises

a content addressable memory (80 on Fig. 2A; column 6, lines 30 – 39).

(11) with regard to claim 12:

Hariguchi et al. further discloses each of the plurality of hash tables in contained

in one or more memory blocks allocated based on hashing of each prefix contained in

the respective hash table using at least a first hash function (inherent be cause hash

tables inherently use hash functions), wherein a number of memory blocks allocated to

the respective hash table does not exceed a predefined number (inherent because the

size of the memory use in an apparatus is always predefined and limited), and wherein

a remainder of prefixes of a length corresponding to prefixes within the respective hash

table are handled by the additional address lookup facility (column 6, lines 30 – 39).

(12) with regard to claim 13:

Hariguchi et al. further discloses a priority encoder (172 on Fig. 5) selecting a

longest prefix match from matches identified within the plurality of hash tables (column

8, lines 4 – 8).

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

9.   Claims 4 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Hariguchi et al. (US 6,665,297) in view of Tal et al. (US 6,625,612).

(1) with regard to claims 4 and 17:

Hariguchi et al. further discloses the at least one hash table (70 on Fig. 2A)

contains prefixes hashed by one hash functions. Haiguchi et al. does not disclose a

second of the two hash functions employed when a collision occurs with a first of the

two hash functions.

Tal et al. teaches using two hash functions and a second of the two hash

functions employed when a collision occurs with a first of the two hash functions

(column 1, lines 54 – 59).

It would have been desirable to use a second hash function when a collision

occurs with a first hash function because it would provide an efficient way to resolve

hash collision. Therefore, it would have been obvious to one of ordinary skill in the art

at the time of the invention to include the method as taught by Tal et al. in the system of

Hariguchi et al.

Response to Arguments

10. Applicant's arguments with respect to claims 1 - 20 have been considered but are

moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the
examiner should be directed to Bo Hui A. Zhu whose telephone number is (571)270-
1086. The examiner can normally be reached on Mon-Thur 10am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's
supervisor, Hassan Kizou can be reached on (571)272-3088. The fax phone number
for the organization where this application or proceeding is assigned is 571-273-8300.

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BZ
Examiner
December 26, 2007
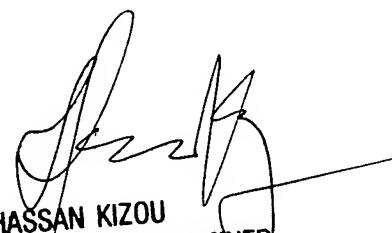
HASSAN KIZOU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600